

## CRAFTSMAN: A Framework for Flexible Robotic Tool Usage, Phase II

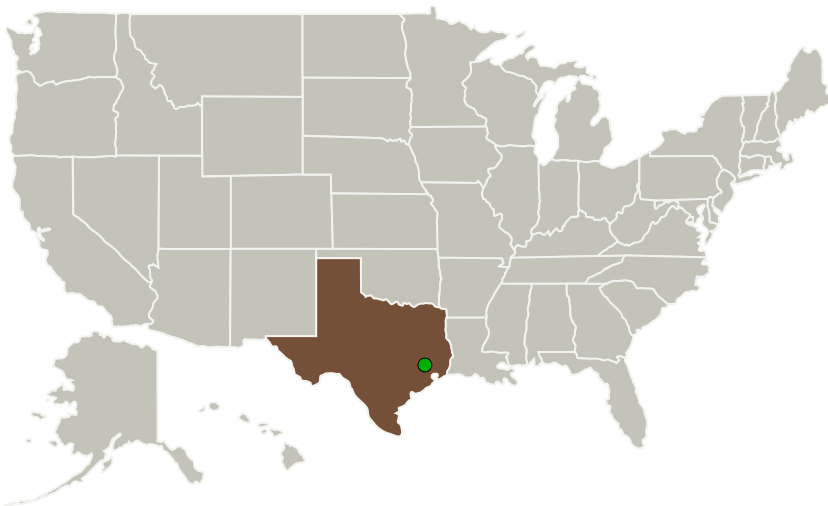
Completed Technology Project (2015 - 2017)



## Project Introduction

TRAC Labs has a long-term goal to provide a software toolkit for flexible tool use by robotic manipulators. Our proposed toolkit is a suite of state-of-the-art algorithms focused on extending current pick-and-place planning and control methods to enable robust tool usage by humanoid and other armed robots. Our system provides more intuitive tools for the user of the robotic manipulator, including visualization tools for defining tool use scenarios, including Cartesian tolerances along trajectories and expected forces/torques on the tool tip. This will allow robots to be more capable and more reliable during long-term autonomous tasks, by significantly improving the ability of remote supervisors to command complex tool-usage tasks, by enabling robots to operate safely alongside humans during shared tasks, and by providing a general tool usage framework that works with novel tools and with any robot configuration.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
TRAC Labs, Inc.	Lead Organization	Industry	Webster, Texas
 Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas



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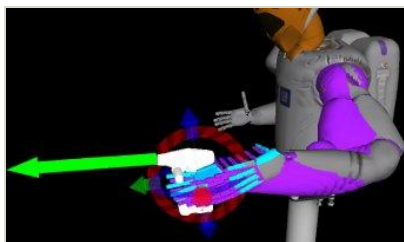
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## Primary U.S. Work Locations

Texas

## Images



### Briefing Chart

CRAFTSMAN: A Framework for Flexible Robotic Tool Usage Briefing Chart

(<https://techport.nasa.gov/image/130104>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

TRAC Labs, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

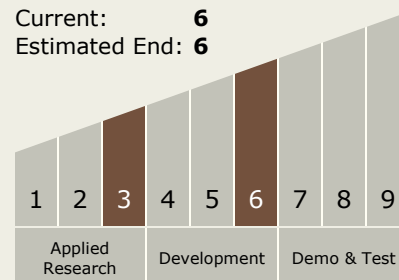
Carlos Torrez

### Principal Investigator:

Patrick F Beeson

## Technology Maturity (TRL)

Start: 3  
Current: 6  
Estimated End: 6



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### Technology Areas

#### Primary:

- TX04 Robotic Systems
  - └ TX04.4 Human-Robot Interaction
    - └ TX04.4.1 Multi-Modal and Proximate Interaction

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System